

1. A constructed DNA compound that comprises double-stranded, deoxyribonucleic acid that encodes a polypeptide with human protein C activity, wherein the coding strand is:

5'-R ¹ N-R ² M-GCC AAC													
AGC	CTG	GAG	CGG	GAG	TCC	TTC	CTG	GAG	GAG	CTC	CGT	CAC	AGC
GAG	GCC	AAG	GAA	ATT	TTC	CAA	AAT	GTG	GAT	GAC	GAC	TTC	GAG
TTC	TGG	TCC	AAG	CAC	GTC	GAC	GGT	GAC	CAG	TGC	ACA	CTG	GCC
CCC	TTG	GAG	CAC	CCG	TGC	GCC	AGC	CTG	TGC	TGC	GGG	CAC	TTG
ACG	TGC	ATC	GAC	GGC	ATC	GGC	AGC	TTC	AGC	TGC	GAC	TGC	GGC
AGC	GGC	TGG	GAG	GGC	CGC	TTC	TGC	CAG	CGC	GAG	GTG	AGC	TTC
CTC	AAT	TGC	TCG	CTG	GAC	AAC	GGC	GGC	TGC	ACG	CAT	TAC	TGC
CTA	GAG	GAG	GTG	GGC	TGG	CGG	CGC	TGT	AGC	TGT	GGC	CCT	GGC
TAC	AAG	CTG	GGG	GAC	GAC	CTC	CTG	CAG	TGT	CAC	CCC	GCA	GTG
AAG	TTC	OCT	TGT	GGG	AGG	CCC	TGG	AAG	CGG	ATG	GAG	AAG	AAG
CGC	AGT	CAC	CTG	AAA	CGA	GAC	ACA	GAA	GAC	CAA	GAA	GAC	CAA
GTA	GAT	CCG	CGG	CTC	ATT	GAT	GGG	AAG	ATG	ACC	AGG	CGG	GGA
GAC	AGC	CCC	TGG	CAG	GTG	GTC	CTG	CTG	GAC	TCA	AAG	AAG	AAG
CTG	GCC	TGC	GGG	GCA	GTG	CTC	ATC	CAC	CCC	TCC	TGG	GTG	CTG
ACA	GCG	GCC	CAC	TGC	ATG	GAT	GAG	TCC	AAG	AAG	CTC	CTT	GTC
AGG	CTT	GGA	GAG	TAT	GAC	CTG	CGG	CGC	TGG	GAG	AAG	TGG	GAG
CTG	GAC	CTG	GAC	ATC	AAG	GAG	GTC	TTC	GTC	CAC	CCC	AAC	TAC
AGC	AAG	AGC	ACC	ACC	GAC	AAT	GAC	ATC	GCA	CTG	CTG	CAC	CTG
GCC	CAG	CCC	GCC	ACC	CTC	TCG	CAG	ACC	ATA	GTG	CCC	ATC	TGC
CTC	CCG	GAC	AGC	GGC	CTT	GCA	GAG	CGC	GAG	CTC	AAT	CAG	GCC
GGC	CAG	GAG	ACC	CTC	GTG	ACG	GGC	TGG	GGC	TAC	CAC	AGC	AGC
CGA	GAG	AAG	GAG	GCC	AAG	AGA	AAC	CGC	ACC	TTC	GTG	CTC	AAC
TTC	ATC	AAG	ATT	CCC	GTG	GTC	CCG	CAC	AAT	GAG	TGC	AGC	GAG
GTC	ATG	AGC	AAC	ATG	GTG	TCT	GAG	AAC	ATG	CTG	TGT	GCG	GGC
ATC	CTC	GGG	GAC	CGG	CAG	GAT	GCC	TGC	GAG	GGC	GAC	AGT	GGG
GGG	CCC	ATG	GTC	GCC	TCC	TTC	CAC	GGC	TGT	GGG	CTC	CTT	CTG
GGC	CTG	GTG	AGC	TGG	GGT	GAG	GGC	TGT	GGG	CTC	CTT	CAC	AAC
TAC	GGC	GTT	TAC	ACC	AAA	GTC	AGC	CGC	TAC	CTC	GAC	TGG	ATC
CAT	GGG	CAC	ATC	AGA	GAC	AAG	GAA	GCC	CCC	CAG	AAG	AGC	TGG
GCA	CCT	TAG-3'											

wherein

A is deoxyadenyl,

G is deoxyguanyl,

C is deoxycytidyl,

T is thymidyl,

R is 5'-GCC CAC CAG GTG CTG CGG ATC
CGC AAA CGT-3' or 5'-CAC CAG GTG CTG
CGG ATC CGC AAA CGT-3'

R¹ is

5'-ATG TGG	CAG	CTC	ACA	AGC	CTC	CTG	CTG	TTC	GTG
GCC ACC	TGG	GGA	ATT	TCC	GGC	ACA	CCA	GCT	CCT
CTT GAC	TCA	GTG	TTC	TCC	AGC	AGC	GAG	CGT-3'	
or 5'-ATG TGG	CAG	CTC	ACA	AGC	CTC	CTG	CTG	TTC	GTG
GCC ACC	TGG	GGA	ATT	TCC	GGC	ACA	CCA	GCT	CCT
CTT GAC	TCA	GTG	TTC	TCC	AGC	AGC	GAG	CGT	GCC-3'

M is 0 or 1, and

N is 0 or 1,

provided that when M is 0, N must necessarily also be 0
and that when

R is 5'-GCC CAC CAG GTG CTG CGG ATC
CGC AAA CGT-3',

R¹ must necessarily be

5'-ATG TGG	CAG	CTC	ACA	AGC	CTC	CTG	CTG	TTC	GTG
GCC ACC	TGG	GGA	ATT	TCC	GGC	ACA	CCA	GCT	CCT
CTT GAC	TCA	GTG	TTC	TCC	AGC	AGC	GAG	CGT-3'	

and that when

R is 5'-CAC CAG GTG CTG CGG ATC CGC
AAA CGT-3',

R¹ must necessarily be

5'-ATG	TGG	CAG	CTC	ACA	AGC	CTC	CTG	CTG	TTC	GTG
GCC	ACC	TGG	GGA	ATT	TCC	GGC	ACA	CCA	GCT	CCT
CTT	GAC	TCA	GTG	TTC	TCC	AGC	AGC	GAG	CGT	GCC-3'.

2. A plasmid comprising the DNA of claim 1.
3. The plasmid of claim 2 that is plasmid pH7.
4. The plasmid of claim 2 that is plasmid pSV2-HCP8.
5. The plasmid of claim 2 that is plasmid pMSV-HPC.
6. The plasmid of claim 2 that is plasmid pL133.
7. The plasmid of claim 2 that is plasmid pL132.
8. The plasmid of claim 2 that is plasmid pL151.
9. The plasmid of claim 2 that is plasmid pL141.
10. The plasmid of claim 2 that is plasmid pL142.
11. The plasmid of claim 2 that is plasmid pMMTABPV-HPC.

12. A method of producing a polypeptide with human protein C activity in a eukaryotic host cell, said method comprising:

- A. transforming said eukaryotic host cell with a recombinant DNA vector, said vector comprising:
 - (i) a DNA sequence that provides for autonomous replication or chromosomal integration of said vector in said host cell;
 - (ii) a promoter and translational activating sequence functional in said host cell; and
 - (iii) a DNA compound of claim 1 positioned in transcriptional and translational reading phase with said promoter and translational activating sequence, provided that when N=1, said translational activating sequence does not encode a translational start codon;

B. culturing said host cell transformed in step A under conditions suitable for gene expression.

13. The method of claim 12, wherein said host cell is selected from the group consisting of cells of HepG-2, *Aedes aegypti*, CV-1, LLC-MK₂, 3T3, CHO-K1, CHO-K1 (dhfr⁻), *Anthrax eucalypti*, HeLa, RPMI8226, H4IIEC3, C127L, and HS-Sultan.

14. The method of claim 13, wherein said host cell is selected from the cell line HepG-2.

15. The method of claim 13, wherein said host cell is selected from the cell line *Aedes aegypti*.

16. The method of claim 13, wherein said host cell is selected from the cell line C127L.

17. The method of claim 13, wherein said host cell is selected from the cell line LLC-MK₂.

18. The method of claim 13, wherein said host cell is selected from the cell line 3T3.

19. The method of claim 13, wherein said host cell is selected from the cell line H4IIEC3.

20. The method of claim 14, wherein the host cell cultured in step B is HepG-2/pL133.

21. The method of claim 14, wherein the host cell cultured in step B is HepG-2/pSV2-HPC8.

22. The method of claim 18, wherein the host cell cultured in step B is 3T3/pL142.

23. The method of claim 16, wherein the host cell cultured in step B is C127L/pSV2-HPC8.

24. The method of claim 12, wherein said recombinant DNA vector further comprises a selectable marker that functions in said eukaryotic host cell.

25. The method of claim 24, wherein the host cell cultured in step B is HepG-2/pL132.

26. The method of claim 24, wherein the host cell cultured in step B is HepG-2/pL151.

27. The method of claim 24, wherein the host cell cultured in step B is HepG-2/pL141.
28. The method of claim 24, wherein the host cell cultured in step B is HepG-2/pMSV-HPC.
29. The method of claim 24, wherein the host cell cultured in step B is RPMI8226/pL151.
30. The method of claim 24, wherein the host cell cultured in step B is RPMI8226/pL132.
31. The method of claim 24, wherein the host cell cultured in step B is RPMI8226/pMSV-HPC.
32. The method of claim 24, wherein the host cell cultured in step B is RPMI8226/pL141.
33. The method of claim 24, wherein the host cell cultured in step B is CV-1/pL132.
34. The method of claim 24, wherein the host cell cultured in step B is CV-1/pL151.
35. The method of claim 24, wherein the host cell cultured in step B is CV-1/pL141.
36. The method of claim 24, wherein the host cell cultured in step B is LLC-MK₂/pL132.
37. The method of claim 24, wherein the host cell cultured in step B is CHO-K1(dhfr⁻)/pL141.
38. The method of claim 24, wherein the host cell cultured in step B is LLC-MK₂/pL141.
39. The method of claim 24, wherein the host cell cultured in step B is LLC-MK₂/pL151.
40. The method of claim 24, wherein the host cell cultured in step B is 3T3/pL132.
41. The method of claim 24, wherein the host cell cultured in step B is CHO-K1/pL151.
42. The method of claim 24, wherein the host cell cultured in step B is 3T3/pMMTABPV-HPC.
43. The method of claim 24, wherein the host cell cultured in step B is CHO-K1/pL141.
44. The method of claim 24, wherein the host cell cultured in step B is CHO-K1(dhfr⁻)/pL151.
45. The method of claim 24, wherein the host cell cultured in step B is HeLa/pL132.
46. The method of claim 24, wherein the host cell cultured in step B is CHO-K1/pMSV-HPC.
47. The method of claim 24, wherein the host cell cultured in step B is H4IIEC3/pL132.
48. The method of claim 24, wherein the host cell cultured in step B is CHO-K1(dhfr⁻)/pMSV-HPC.
49. The method of claim 24, wherein the host cell cultured in step B is H4IIEC3/pMMTABPV-HPC.
50. The method of claim 24, wherein the host cell cultured in step B is H4IIEC3/pL141.
51. The method of claim 24, wherein the host cell cultured in step B is C1271/pL151.
52. The method of claim 24, wherein the host cell cultured in step B is C1271/pMMTABPV-HPC.
53. The method of claim 24, wherein the host cell cultured in step B is C1271/pL141.
54. The method of claim 24, wherein the host cell cultured in step B is HS-Sultan/pL132.
55. The method of claim 24, wherein the host cell cultured in step B is HS-Sultan/pL141.
56. The host cell used in the method of claim 20 which is HepG-2/pL133.
57. The host cell used in the method of claim 23 which is C1271/pSV2-HPC8.

58. The host cell used in the method of claim 25 which is HepG-2/pL132.

59. The host cell used in the method of claim 26 which is HepG-2/pL151.

60. The host cell used in the method of claim 27 which is HepG-2/pL141.

61. The host cell used in the method of claim 32 which is RPMI8226/pL141.

62. The host cell used in the method of claim 35 which is CV-1/pL141.

63. The host cell used in the method of claim 36 which is LLC-MK₂/pL132.

64. The host cell used in the method of claim 41 which is CHO-K1/pL151.

65. The host cell used in the method of claim 43 which is CHO-K1/pL141.

66. The host cell used in the method of claim 44 which is CHO-K1(dhfr⁻)/pL151.

67. The host cell used in the method of claim 52 which is C1271/pMMTΔBPV-HPC.

68. The double-stranded deoxyribonucleic acid of claim 1, wherein N is 0 and M is 1.

69. A method of producing human protein C activity in a prokaryotic host cell, said method comprising:

A. transforming said prokaryotic host cell with a recombinant DNA vector, said vector comprising:

(i) a DNA sequence that provides for autonomous replication or chromosomal integration of said vector in said host cell;

(ii) a promoter and translational activating sequence functional in said host cell;

(iii) a DNA compound of claim 1, wherein N=0 and M=0 or 1, positioned in transcriptional and translational reading phase with said promoter and translational activating sequence; and

(iv) a selectable marker;

B. culturing said prokaryotic host cell under conditions suitable for gene expression.

70. The method of claim 69, wherein said prokaryotic host cell is selected from the group consisting of *Bacillus*, *Streptomyces*, and *E. coli*.

71. The method of claim 70, wherein said host cell is *E. coli* K12.

72. The method of claim 71, wherein said host cell is *E. coli* K12 RV308.

73. The method of claim 71, wherein said host cell is *E. coli* K12 MM294.

74. The method of claim 71, wherein said host cell is *E. coli* K12 RR1.

75. The method of claim 71, wherein said host cell is *E. coli* K12 RR1AM15.

76. A plasmid selected from the group consisting of pUC19HC, pCZ118, pCZ10, pCZ11, pCZ451, pCZ459, and pCZ455.

77. The plasmid of claim 2 that is plasmid pCZ460.

78. The host cell cultured in step B of the method of claim 72 that is *E. coli* K12 RV308/pCZ460.

79. The host cell cultured in step B of the method of claim 73 that is *E. coli* K12 MM294/pCZ460.

80. A method of claim 12, wherein said host cell is a CHO-K1 host cell, including the dhfr⁻ derivatives thereof.

81. A constructed, recombinant DNA sequence that comprises the coding sequence for the active light chain of human protein C, said active light chain having the amino acid residue sequence:

ALA	ASN	SER	PHE	LEU	GLU	GLU	LEU	ARG	HIS	SER	SER	LEU	GLU	ARG	GLU
CYS	ILE	GLU	GLU	ILE	CYS	ASP	PHE	GLU	GLU	ALA	LYS	GLU	ILE	PHE	GLN
ASN	VAL	ASP	ASP	THR	LEU	ALA	PHE	TRP	SER	LYS	HIS	VAL	ASP	GLY	ASP
GLN	CYS	LEU	VAL	LEU	PRO	LEU	GLU	HIS	PRO	CYS	ALA	SER	LEU	CYS	CYS
GLY	HIS	GLY	THR	CYS	ILE	ASP	GLY	ILE	GLY	SER	PHE	SER	CYS	ASP	CYS
ARG	SER	GLY	TRP	GLU	GLY	ARG	PHE	CYS	GLN	ARG	GLU	VAL	SER	PHE	LEU
ASN	CYS	SER	LEU	ASP	ASN	GLY	GLY	CYS	THR	HIS	TYR	CYS	LEU	GLU	GLU
VAL	GLY	TRP	ARG	ARG	CYS	SER	CYS	ALA	PRO	GLY	TYR	LYS	LEU	GLY	ASP
ASP	LEU	LEU	GLN	CYS	HIS	PRO	ALA	VAL	LYS	PHE	PRO	CYS	GLY	ARG	PRO
TRP	LYS	ARG	MET	GLU	LYS	LYS	ARG	SER	HIS	LEU					

wherein ALA is Alanine, ARG is Arginine, ASN is Asparagine, ASP is Aspartic Acid, CYS is Cysteine, GLN is Glutamine, GLU is Glutamic Acid, GLY is Glycine, HIS is Histidine, ILE is Isoleucine, LEU is Leucine, LYS is Lysine, MET is Methionine, PHE is Phenylalanine, PRO is Proline, SER is Serine, THR is Threonine, TRP is Tryptophan, TYR is Tyrosine, and VAL is Valine.

82. The DNA sequence of claim 81 wherein the coding strand is:

			5'-GCC	AAC	TCC	TTC	CTG	GAG	GAG	CTC	CGT	CAC	AGC
AGC	CTG	GAG	CGG	GAG	TGC	ATA	GAG	GAG	ATC	TGT	GAC	TTC	GAG
GAG	GCC	AAG	GAA	ATT	TTC	CAA	AAT	GTG	GAT	GAC	ACA	CTG	GCC
TTC	TGG	TCC	AAG	CAC	GTC	GAC	GGT	GAC	CAG	TGC	TTG	GTC	TTG
CCC	TTG	GAG	CAC	CCG	TGC	GCC	AGC	CTG	TGC	TGC	GGG	CAC	GGC
ACG	TGC	ATC	GAC	GGC	ATC	GGC	AGC	TTC	AGC	TGC	GAC	TGC	CGC
AGC	GGC	TGG	GAG	GGC	CGC	TTC	TGC	CAG	CGC	GAG	GTG	AGC	TTC
CTC	AAT	TGC	TCG	CTG	GAC	AAC	GGC	GGC	TGC	ACG	CAT	TAC	TGC
CTA	GAG	GAG	GTG	GGC	TGG	CGG	CGC	TGT	AGC	TGT	GCG	CCT	GGC
TAC	AAG	CTG	GGG	GAC	GAC	CTC	CTG	CAG	TGT	CAC	CCC	GCA	GTG
AAG	TTC	CCT	TGT	GGG	AGG	CCC	TGG	AAG	CGG	ATG	GAG	AAG	AAG
CGC	AGT	CAC	CTG-3'										

wherein A is deoxyadenyl, G is deoxyguanyl, C is deoxycytidyl, and T is thymidyl.

83. The constructed,
recombinant DNA sequence of claim 81,
further comprising the constructed
recombinant DNA sequence that comprises
the coding sequence for the active heavy
chain of human protein C, said active heavy
chain having the amino acid residue
sequence:

LEU ILE ASP GLY LYS
MET THR ARG ARG GLY ASP SER PRO
TRP GLN VAL VAL LEU LEU ASP SER
LYS LYS LYS LEU ALA CYS GLY ALA
VAL LEU ILE HIS PRO SER TRP VAL
LEU THR ALA ALA HIS CYS MET ASP
GLU SER LYS LYS LEU LEU VAL ARG
LEU GLY GLU TYR ASP LEU ARG ARG
TRP GLU LYS TRP GLU LEU ASP LEU
ASP ILE LYS GLU VAL PHE VAL HIS
PRO ASN TYR SER LYS SER THR THR
ASP ASN ASP ILE ALA LEU LEU HIS
LEU ALA GLN PRO ALA THR LEU SER
GLN THR ILE VAL PRO ILE CYS LEU
PRO ASP SER GLY LEU ALA GLU ARG
GLU LEU ASN GLN ALA GLY GLN GLU
THR LEU VAL THR GLY TRP GLY TYR
HIS SER SER ARG GLU LYS GLU ALA
LYS ARG ASN ARG THR PHE VAL LEU
ASN PHE ILE LYS ILE PRO VAL VAL
PRO HIS ASN GLU CYS SER GLU VAL
MET SER ASN MET VAL SER GLU ASN
MET LEU CYS ALA GLY ILE LEU GLY
ASP ARG GLN ASP ALA CYS GLU GLY
ASP SER GLY GLY PRO MET VAL ALA
SER PHE HIS GLY THR TRP PHE LEU

VAL GLY LEU VAL SER TRP GLY GLU
GLY CYS GLY LEU LEU HIS ASN TYR
GLY VAL TYR THR LYS VAL SER ARG
TYR LEU ASP TRP ILE HIS GLY HIS
ILE ARG ASP LYS GLU ALA PRO GLN
LYS SER TRP ALA PRO

wherein ALA is Alanine, ARG is Arginine,
ASN is Asparagine, ASP is Aspartic Acid,
CYS is Cysteine, GLN is Glutamine, GLU is
Glutamic Acid, GLY is Glycine, HIS is
Histidine, ILE is Isoleucine, LEU is
Leucine, LYS is Lysine, MET is
Methionine, PHE is Phenylalanine, PRO is
Proline, SER is Serine, THR is Threonine,
TRP is Tryptophan, TYR is Tyrosine, and
VAL is Valine.

³
87. The method of claim 12,
further comprising isolating said polypeptide
with human protein C activity.

⁴
88. The method of claim ³87,
wherein said polypeptide is human protein C
zymogen.

⁵
89. The method of claim ⁴88,
which further comprises activating the
human protein C zymogen to produce human
activated protein C.

⁶
90. A method of claim ⁵89,
wherein the activation step is performed
using the thrombin/thrombomodulin
complex.

2nd 1

88. The method of claim 88.

87
90
λ The method of claim 12.

91. The plasmid of claim 2,

92. The plasmid of claim 2,

[illegible]